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**WEST**

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L12: Entry 1 of 5

File: PGPB

Nov 8, 2001

DOCUMENT-IDENTIFIER: US 20010039254 A1

TITLE: Process and apparatus for the production of a detergent bar

BSTX:

[0029] Differing chemical components, could, for example, be different detergent components such as, a soap and a synthetic non-soap surfactant. However, it is an especially preferred variant to provide at least one zone containing a detergent (soap or non-soap synthetic surfactant) and another zone or zones containing a benefit agent. Details of suitable benefit agents are described further, hereinbelow.

BSTX:

[0069] Structure (including part structuring) can be provided, for example, by liquid crystal formation, a polymeric structuring agent or clay, or a sufficient volume of a dispersed solid component which will affect the viscosity. A solid component can provide structure by interacting to form a network within the detergent composition or through the simple physical interaction/contact of the solid particles with one another or with the continuous phase.

BSTX:

[0071] Structured liquids can be "internally structured", whereby the structure is formed by primary ingredients, preferably by surfactant material (i.e. anisotropic or having liquid crystal phases), and/or "externally structured" whereby a three dimensional matrix structure is provided by using secondary additives, for example, polymers (e.g. Carbopols), clay, silica and/or silicate material (including in situ formed aluminosilicates). Such secondary additives may be present at a level of 1-10% by weight of the detergent composition.

BSTX:

[0086] Suitable synthetic detergents for use in the process of the present invention include anionic surfactants such as C.sub.8-C.sub.22 aliphatic sulphonates, aromatic sulphonates (e.g. alkyl benzene sulphonate), alkyl sulphates (e.g. C.sub.12-C.sub.18 alkyl sulphates), alkyl ether sulphates (e.g. alkyl glyceryl ether sulphates).

BSTX:

[0087] Suitable aliphatic sulphonates include, for example, primary alkane sulphonate, primary alkane disulphonate, alkene sulphonate, hydroxyalkane sulphonate or alkyl glyceryl ether sulphonate (AGS).

BSTX:

[0088] Other anionic surfactants that can also be used include alkyl sulphosuccinates (including mono- and dialkyl, e.g. C.sub.6-C.sub.22 sulphosuccinates), alkyl and acyl taurates, alkyl and acyl sarcosinates, sulphoacetates, alkyl phosphates, alkyl phosphate esters, alkoxyl alkyl phosphate esters, acyl lactates, monoalkyl succinates and maleates, sulphoacetates.

BSTX:

[0091] The anionic surfactants used are preferably mild, i.e. a surfactant which does not damage the stratum corneum, the outer layer of the skin. Harsh surfactants such as primary alkane sulphonate or alkyl benzene sulphonate will generally be avoided.

BSTX:

[0092] The synthetic detergents of the present invention may also comprise cationic surfactants, especially cationic surfactants suitable for use in treating hair and other keratinic material.

BSTX:

[0096] Suitable cationic polymers include, for example, copolymers of vinyl monomers having cationic amine or quaternary ammonium functionalities with water soluble spacer monomers such as (meth)acrylamide, alkyl

and dialkyl (meth)acrylamides, alkyl (meth)acrylate, vinyl caprolactone and vinyl pyrrolidine. The alkyl and dialkyl substituted monomers preferably have C1-C7 alkyl groups, more preferably C1-3 alkyl groups. Other suitable spacers include vinyl esters, vinyl alcohol, maleic anhydride, propylene glycol and ethylene glycol.

BSTX:

[0104] mineral acid salts of amino-alkyl esters of homo-and co-polymers of unsaturated carboxylic acids having from 3 to 5 carbon atoms, (as described in U.S. Pat. No. 4,009,256 (National Starch));

BSTX:

[0108] wherein: A is an anhydroglucose residual group, such as a starch or cellulose anhydroglucose residual. R is an alkylene, oxyalkylene, polyoxyalkylene, or hydroxyalkylene group, or combination thereof. R.sup.1, R.sup.2 and R.sup.3 independently represent alkyl, aryl, alkylaryl, arylalkyl, alkoxyalkyl, or alkoxyaryl groups, each group containing up to about 18 carbon atoms. The total number of carbon atoms for each cationic moiety (i.e., the sum of carbon atoms in R.sup.1, R.sup.2 and R.sup.3) is preferably about 20 or less, and X is an anionic counterion.

BSTX:

[0117] Amphoteric detergents which may be used in this invention include at least one acid group. This may be a carboxylic or a sulphonic acid group. They include quaternary nitrogen and therefore are quaternary amido acids. They should generally include an alkyl or alkenyl group of 7 to 18 carbon atoms. Suitable amphoteric detergents include simple betaines or sulphobetaines.

BSTX:

[0120] The nonionic which may be used includes in particular the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example aliphatic alcohols, acids, amides or alkyl phenols with alkylene oxides, especially ethylene oxide either alone or with propylene oxide. Specific nonionic detergent compounds are alkyl (C.sub.6-C.sub.22) phenols-ethylene oxide condensates, the condensation products of aliphatic (C.sub.8-C.sub.18) primary or secondary linear or branched alcohols with ethylene oxide, and products made by condensation of ethylene oxide with the reaction products of propylene oxide and ethylenediamine. Other so-called nonionic detergent compounds include long chain tertiary amine oxides, long chain tertiary phosphine oxides and dialkyl sulphoxides.

BSTX:

[0122] Other surfactants which may be used are described in U.S. Pat. No. 3,723,325 and alkyl polysaccharide nonionic surfactants as disclosed in U.S. Pat. No. 4,565,647.

BSTX:

[0133] Clays and paraffin wax.

BSTX:

[0137] For laundry bars intended for the washing of clothes, the bar will normally contain one or more detergent components commonly used in so-called non-soap detergent (NSD) fabrics washing bars. In the widest sense such detergent component may be chosen from one or more anionic, cationic, non-ionic, amphoteric and zwitterionic surface-active compounds and mixtures thereof. Many suitable surface-active compounds are available and are fully described in the literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

BSTX:

[0147] Silicone oils, gums and modifications thereof such as linear and cyclic polydimethylsiloxanes; amino, alkyl, alkylaryl and aryl silicone oils. The silicone oil used may have a viscosity in the range 1 to 100,000 centistokes. Fats and oils including natural fats and oils such as jojoba, soyabean, rice bran, avocado, almond, olive, sesame, persic, castor, coconut, mink, arachis, corn, cotton seed, palm kernel, rapeseed, safflower seed and sunflower oils; cocoa butter, beef tallow, lard; hardened oils obtained by hydrogenating the aforementioned oils; and synthetic mono, di and triglycerides such as myristic acid glyceride and 2-ethylhexanoic acid glyceride;

BSTX:

[0152] Esters such as cetyl octanoate, cetyl lactate, myristyl lactate, cetyl palmitate, butyl myristate, butyl stearate, decyl oleate, cholesterol isostearate, myristyl myristate, glyceryl laurate, glyceryl ricinoleate, glyceryl stearate, alkyl lactate, alkyl citrate, alkyl tartrate, glyceryl isostearate, hexyl laurate, isobutyl palmitate, isocetyl stearate, isopropyl isostearate, isopropyl laurate, isopropyl linoleate, isopropyl myristate, isopropyl palmitate, isopropyl stearate, isopropyl adipate, propylene glycol monolaurate, propylene glycol ricinoleate, propylene

glycol stearate, and propylene glycol isostearate;

BSTX:

[0155] Vitamins such as vitamin A and E, and vitamin alkyl esters, including those vitamin C alkyl esters;

BSTX:

[0157] Anti-wrinkle agents such as retinol A and alphahydroxy acids.

BSTX:

[0163] Particular examples of suitable fabric care benefit agents include silicones, fabric softening clays, or L-beta phase surfactants.

BSTX:

[0166] If the benefit agent is a fabric softening agent it preferably comprises a clay, a cationic active, or silicone. Suitable clays include a three layered smectite clay, preferably having a cation exchange capacity as described in GB-A-1 400 898. Especially preferred are clays which are 2:1 layer phyllosilicates possessing a lattice charge deficiency in the range of 0.2 to 0.4 g equivalents per half unit cell as described in EP-A-0 350 288.

BSTX:

[0168] It is particularly advantageous if the cationic softening compound is a quaternary ammonium compound in which at least one long chain alkyl group is connected to the quaternary ammonium group via at least one ester link. Suitable cationic softeners are described in U.S. Pat. No. 4,137,180 and WO-A-93/23510.